

Physics
CPT VIOLATION IN A CLASSICAL SYSTEM

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A theory with Lorentz violation, referred to as the standard-model extension, is considered in the context of classical mechanics. The violation occurs through the appearance of fixed vector-like background fields that break the symmetry under rotations and boosts. Particles with spin experience unconventional effects. For example, the momentum vector may point in a direction other than the direction of the velocity vector. Intuition about this theory is gained by considering a classical collision between two particles. The CPT theorem says theories that violate Lorentz symmetry may also violate the combined charge conjugation, parity inversion, and time reversal transformations. This simple classical example violates CPT symmetry.